

## Completed Research Projects With CDC-EHDI Funding

### ***Efficacy of Two-Stage (OAE/AABR) Newborn Hearing Screening Protocol – University of Hawai'i (UH), University of Hawai'i Center on Disability Studies***

*Hawai'i has sub-contracted to the Utah State University (Research Coordinator) and to University of Kansas (Diagnostic Evaluation Coordinator). Thirteen hospitals were involved in data collection: Kapiolani Medical Center, Hawaii; Long Island Jewish Medical Center, New York; Woman & Infants Hospital, Rhode Island; North Shore Hospital, New York; Huntington, New York, Plainview, New York; Arnold Palmer, Florida; Good Samaritan Hospital, Ohio; Lawrence and Memorial, Connecticut; Hartford Hospital, Connecticut; North Bronx Healthcare Network, New York; Via Christi, Kansas; and Jacobi Medical, New York.*

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**Background:** The two technologies that are commonly used for universal newborn hearing screening are automated auditory brainstem response (AABR) and otoacoustic emissions (OAE). The National Institutes of Health's Consensus Development Conference Statement recommended a two-stage screening protocol, OAE followed by AABR. Many hospitals have adopted this model. If an infant fails OAE but passes AABR, he/she is usually dismissed from the follow-up program. Concerns have been raised that these infants might have a hearing loss that would have been detected by the AABR.

**Purpose:** This project investigated the accuracy of the two-stage screening process in detecting infants with hearing loss.

**Methods:** Families whose infants failed the OAE but passed the AABR were invited to participate in the study. Study families were asked to bring their infants to a testing site at 8-10 months of age for a comprehensive audiologic evaluation. Furthermore, the study was expanded to gather data on infants who did not pass both the OAE and the AABR. These additional data provided an accurate estimate of the proportion of all babies with congenital hearing loss who are being missed by the two-stage protocol.

**Summary of Results:** This project indicated that a substantial number of infants with hearing loss will be missed by the OAE / AABR protocol. In this study population, 23% of children with permanent hearing loss at age 9 months were missed. The findings of this study have been presented at numerous professional meetings, and published as "A Multicenter Evaluation of How Many Infants With Permanent Hearing Loss Pass a Two-State Otoacoustic Emissions/Automated Auditory Brainstem Response Newborn Hearing Screening Protocol," Johnson et al., *Pediatrics*, Vol 116, No. 3, September 2005. Additionally, four supplementary articles were published in the *American Journal of Audiology*, Vol 14, December 2005. (*Updated 10/2006*)